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Northwest Territories, Dept. of Municipal and Community Affairs.

AN UPDATE OF THE STATUS OF SOLID WASTE MANAGEMENT IN COMMUNITIES OF THE NORTHWEST TERRITORIES. / Heinke, Gary W.; Wong, Jeffrey. 1990.

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CA2NWMC 90U67



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*AN UPDATE OF THE STATUS OF SOLID WASTE MANAGEMENT
IN COMMUNITIES OF THE NORTHWEST TERRITORIES*

INTERIM REPORT

For the

*Department of Municipal and Community Affairs
Government of the Northwest Territories*

By

Gary W. Heinke, Ph.D., P.Eng.

Jeffrey Wong

May 1990

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FORWARD AND ACKNOWLEDGEMENT

It became apparent during the concurrent study on "Guidelines for the Planning, Design, Operation and Maintenance of Solid Waste Modified Landfill Sites in the Northwest Territories" that insufficient information was available in the files of the Department of Municipal and Community Affairs (MACA) or other relevant departments on the current status of waste management in NWT communities. With the agreement of the Department of Municipal and Community Affairs a questionnaire survey was carried out of all NWT communities. To-date 44 of the 61 communities surveyed have responded. Overall the responses have been well prepared and are very useful. This interim report summarises the responses received. We urge MACA to try to obtain the remaining 17 responses this summer in order to complete the survey. A final report will then be issued by the fall of 1990.

We wish to acknowledge the very helpful cooperation received from Ken Johnson, P.Eng. of MACA. We also are grateful to all the local people who have taken this survey seriously and provided helpful information and comments. We recommend that a copy of the final report be made available to every community.

This update on the status of solid waste management in NWT communities should be useful information for a future update on all community services.

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1. INTRODUCTION AND BACKGROUND

The solid waste disposal system of communities in the Northwest Territories has received considerable attention in the past few years. Inefficient and poorly maintained dumps have been slowly replaced by well designed and efficiently managed modified landfill sites, and many more are in the planning stages. As a result of this growing trend toward providing improved services, the current status of solid waste management has changed significantly from what it was ten or fifteen years ago.

This report outlines the current status of solid waste collection, disposal, operation and maintenance of forty-four communities of the Northwest Territories. The basic information has been obtained through a questionnaire survey during the fall of 1989.

Several reports of the status of community water and sanitation services in the Northwest Territories are available. In 1973, Heinke [1] described municipal services for NWT communities as they existed in 1970 and 1971. Almost ten years later in 1982, a comprehensive inventory report of community water and sanitation services published by the Water and Sanitation Section of the NWT government [2] revealed that despite improvements in overall municipal services deficiencies in solid waste disposal existed. A summary paper was prepared by Christensen [3] in the same year. Christensen assessed the municipal services of all NWT communities with respect to public health and environmental objectives and categorized these services as acceptable, generally acceptable and unacceptable.

The need for this report originated during the preparation of Guidelines for the Planning, Design, Operation and Maintenance of Solid Waste Modified Landfill Sites in the Northwest Territories [4]. It became evident that updated comprehensive information concerning all aspects of solid waste collection, disposal, operation and maintenance was not available centrally. The only routine update is provided by the Department of Indian and Northern Affairs through periodic inspection of community water and waste disposal systems. This information is up-to-date on only some communities.

2. METHODOLOGY

Time and financial considerations precluded visits to each community for detailed assessment of solid waste management. Instead, information was obtained by means of a solid waste management survey. A completed survey is provided in Appendix A. The survey is divided into three sections; solid waste collection, solid waste disposal and, operation and maintenance of solid waste disposal sites.

Surveys were distributed to all 61 communities of the NWT through the Department of Municipal and Community Affairs, Yellowknife in the fall of 1989. It was important that the person completing the questionnaire be thoroughly familiar with the operation of the solid waste system in the community, as this was expected to yield the most accurate information. The questionnaire was designed to be easily answerable to obtain as close to a complete return as possible. Space was provided for personal comments, some of which are included in Appendix B.

Of the 61 surveys distributed, 44 were completed and received by April 1990. Figure 1 and the following list show the communities from which surveys have been received or not received to date.

Received:

BAFFIN REGION

Arctic Bay
Broughton Island
Cape Dorset
Clyde River
Hall Beach
Lake Harbour
Pond Inlet
Resolute Bay
Sanikiluaq

KEEWATIN REGION

Arviat
Chesterfield Inlet
Rankin Inlet
Repulse Bay
Whale Cove

KITIKMEOT

Cambridge Bay
Coopermine
Gjoa Haven
Holman Island
Pelly Bay
Spence Bay

INUVIK

Aklavik
Arctic Red River
Fort Franklin
Fort Good Hope
Fort McPherson
Fort Norman
Paulatuk
Sachs Harbour
Tuktoyaktuk

FORT SMITH REGION

Detah
Rae-Edzo
Enterprise
Fort Liard
Fort Providence
Fort Resolution
Hay River
Kakisa
Lac La Martre
Nahanni Butte
Rae
Rae Lakes
Snowdrift
Trout Lake
Wrigley

Not Received:

BAFFIN REGION

Grise Ford
Igloolik
Iqaluit
Nanisivik
Pangnirtung

KITIKMEOT REGION

Bathurst Inlet

INUVIK REGION

Colville Lake
Inuvik
Norman Wells

KEEWATIN REGION

Baker Lake
Coral Harbour

FORT SMITH REGION

Fort Simpson
Fort Smith
Jean Marie River
Port Radium
Snare Lake
Yellowknife

It must be emphasized that conclusions drawn by the authors about the acceptability or nonacceptability of solid waste management depend heavily on the accuracy and completeness of the questionnaire provided by the community. It may be useful to provide a draft of this report to each region/community for comments before the final report is issued.

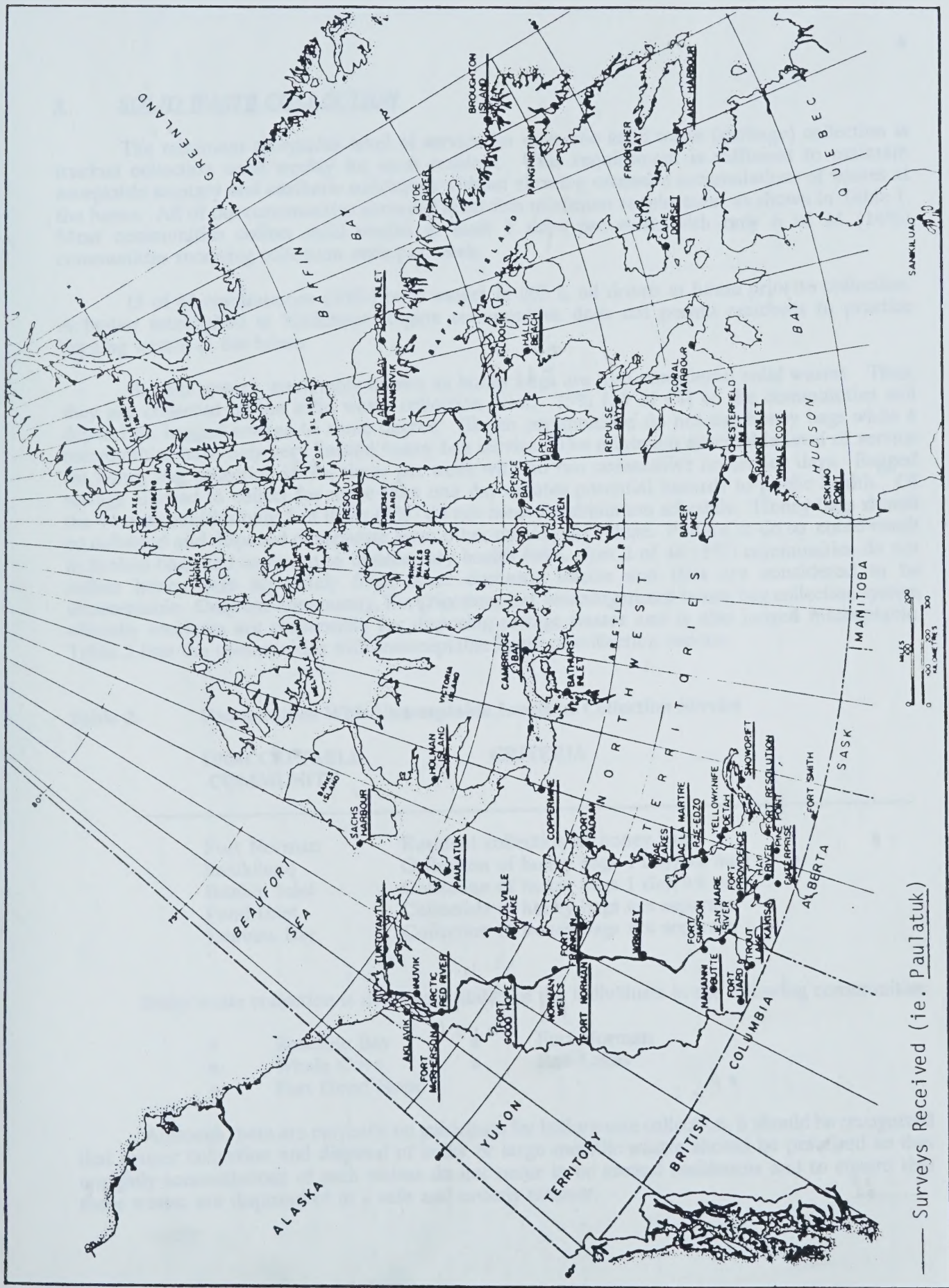


FIGURE 1. LOCATION OF SURVEYED COMMUNITIES

3. SOLID WASTE COLLECTION

The minimum acceptable level of service for domestic solid waste (garbage) collection is trucked collection once weekly for each resident. This requirement is sufficient to maintain acceptable sanitary and aesthetic conditions without allowing excessive accumulations of wastes at the home. All of the communities surveyed meet this minimum requirement as shown in Table 1. Most communities collect solid wastes at least 2 days per week with only 6 of 44 (14%) communities receiving collection once per week.

13 of 44 communities (30%) burn wastes in 205 L oil drums at home prior to collection. A by-law established in Kitikmeot Region communities does not permit residents to practice burning wastes at the home.

Bagged sewage, commonly known as honey bags are also considered solid wastes. Thus, they are collected by the solid waste collection crew. 75% (33 of 44) of the communities still depend on bagged sewage to some degree. Eleven communities do not use honey bags while 4 communities have only very limited honey bag service. The minimum acceptable level of service for honey bag collection is five times per week with no two consecutive no-service days. Bagged sewage allowed to collect for more than one day creates potential hazards to public health. Of the 44 communities only 2 of them (5%) do not meet the minimum schedule. Honey bags should be collected and disposed of separate from other community refuse. Failure to do so could result in broken bags and exposure to unnecessary health risks. Just 2 of 44 (5%) communities do not collect honey bags separately from other domestic wastes and thus are considered to be unacceptable. Only one community, Fort Norman, has an unorganized honey bag collection system whereby residents are responsible for disposing sewage wastes and is also judged unacceptable. Table 2 lists the communities with unacceptable levels of collection service.

Table 2. Communities With Unacceptable Levels of Collection Service

UNACCEPTABLE COMMUNITY	CRITERIA
Fort Norman	Resident collection of honey bags
Sanikiluaq	Collection of honey bags 1 day/wk only
Rankin Inlet	Collection of honey bags 1 day/wk only
Pond Inlet	Collection of honey bags not separate
Repulse Bay	Collection of honey bags not separate

Bulky waste collection is the responsibility of the individuals in the following communities:

- | | |
|------------------|---------------|
| ● Resolute Bay | ● Fort Norman |
| ● Whale Cove | ● Rae Lakes |
| ● Fort Good Hope | |

Although there are currently no guidelines for bulky waste collection, it should be recognized that proper collection and disposal of bulky or large metallic wastes should be practised so that unsightly accumulations of such wastes do not occur in or around residences and to ensure that these wastes are disposed of in a safe and orderly manner.

Table 1. Survey Summary of Solid Waste Collection

Community	Collection Responsibility	Collection Vehicle	Collection Frequency (days per week)	Collection Crew Size	Burning at Home	Honey Bag Collection Vehicle	Separate Honey Bag Collection	Honey Bag Collection Frequency (days per week)	Spring Clean-up	Bulky Waste Collection Responsibility
BAFFIN REGION										
Arctic Bay	Hamlet	Stake truck	Daily	2	No	Same	Yes	Daily	July	Hamlet, individuals
Broukton Island	Hamlet	Haul-All	>2	1, 2	Some	Same	Yes	Alternate days	July	Hamlet, Dew Line
Cape Dorset	Hamlet	Haul-All	>2	3	No	Different	Yes	Daily	July, August	Hamlet
Clyde River	Hamlet	Haul-All	Daily	1	No	Same	Yes	Daily	August	Hamlet
Grise Fiord										
Hall Beach	Hamlet	Stake truck	>2	1	No	Same	Yes	Daily	June	Hamlet
Igloodik										
Iqaluit										
Lake Harbour	Hamlet	Haul-All	3	1	No	Same	Yes	Daily ¹	July	Hamlet
Nanisivik										
Pangnirtung	Hamlet	Haul-all, Packer	Daily	2	Once/yr.	Same	No	3	July	Hamlet
Pond Inlet	Hamlet	Pick-up	Daily	1	No	--	--	--	August	Individuals
Resolute Bay	Hamlet	Stake truck	>2	2	No	Same	Yes	1	June	Hamlet
Sanikiluaq										
KEENWATIN REGION										
Arviat	Hamlet	Packer, Pick-up	>2	4	Yes	Same	Yes	>2	Snowmelt	
Baker Lake										
Chesterfield Inlet	Hamlet	Haul-All	>2	2	Some	Same	Yes, No ²	>2 ³	July	Hamlet
Coral Harbour										
Rankin Inlet	Hamlet	Packer	1	3	Yes	Loader	Yes	1 ⁴	June	Hamlet
Repulse Bay	Hamlet	Stake truck	>2	1	No ⁵	Same	No	Daily	July, August	Hamlet
Whale Cove	Hamlet	Haul-All	Daily	2	No	Same	Yes	Daily	July	Individuals

1. Collection at 2 houses

2. With domestic waste in winter, separately in summ

3. Collection at 2 or 3 houses

4. Collection at 2 houses

5. Bay and co-op burn

Table 1. Survey Summary of Solid Waste Collection

(Continued)

Community	Collection Responsibility	Collection Vehicle	Collection Frequency (days per week)	Collection Crew Size	Burning at Home	Honey Bag Collection Vehicle	Separate Honey Bag Collection	Honey Bag Collection Frequency (days per week)	Spring Clean-up	Bulky Waste Collection Responsibility
KITIKMEOT REGION										
Bathurst Inlet	Hamlet	Haul-All	2	2	No ¹	Same	Yes	2		
Cambridge Bay	Hamlet	Haul-All	2	2	No	Same	Yes	2		
Coppermine	Hamlet	Haul-All	2	2	No	Same	Yes	2		
Gjoa Haven	Hamlet	Haul-All	2	2	No	Same	Yes	2		
Holman Island	Hamlet	Haul-All	2	2	No	Same	Yes	2		
Pelly Bay	Hamlet	Haul-All	2	2	No	Same	Yes	2		
Spence Bay	Hamlet	Haul-All	2	2	No	Same	Yes	2		
INUVIK REGION										
Aklavik	Contractor Settlement	Pick-up Loader	>2	2	Yes	Different	Yes	Alternate days	June	Hamlet Settlement
Arctic Red River			2	2	Yes	Same	Yes	2	June	
Colville Lake	Hamlet	Dump truck	2	2	No	Same	Yes	2	June	Hamlet
Fort Franklin	Contractor	Packer	3	2	No	Different	Yes	3	June	Not collected
Fort Good Hope	Contractor	Haul-All	3	2	No	Different ²	Yes	3	June	Hamlet
Fort McPherson	Contractor	F-700	>2	1	No	Resident Responsibility			June	Individuals
Fort Norman										
Inuvik										
Norman Wells										
Paulatuk	Hamlet	Dump truck	>2	1	No	Loader	Yes	3 ³	July	Hamlet
Sachs Harbour	Hamlet	Haul-All ⁴	2	1	No ⁵	--	--	--	July	Hamlet
Tuktoyaktuk	Contractor	Haul-All	6	2	No	Pick-up	Yes	6	June ⁶	Hamlet

1. By-laws in Kitikmeot Region communities does not allow this practice

2. 1/2 ton trailer

3. Collection from 20 houses

4. Side dump/loader

5. Except for nursing station

6. By students

Table 1. Survey Summary of Solid Waste Collection

(Continued)

Community	Collection Responsibility	Collection Vehicle	Collection Frequency (days per week)	Collection Crew Size	Burning at Home	Honey Bag Collection Vehicle	Separate Honey Bag Collection	Honey Bag Collection Frequency (days per week)	Spring Clean-up	Bulky Waste Collection Responsibility
FORT SMITH REGION										
Detah	Contractor	Pick-up	>2	1	No	Same	Yes	3	June	Contractor
Rae-Edzo	Contractor	Haul-All	2	2	No	Different ¹	Yes	6	Snowmelt	Hamlet
Enterprise	Contractor	Pick-up	1	1	No	--	--	--	May	Contractor
Fort Liard	Settlement	Stake truck	1	2	No	--	--	--	April	Settlement
Fort Providence	Contractor	Haul-All	2	1	No	--	--	--	May	Contractor
Fort Resolution	Contractor	Packer	2	2	Yes	--	--	--	Snowmelt	Contractor
Fort Simpson										
Fort Smith	Town	Dump truck			No	--	--	--	Yes	Town
Hay River										
Jean Marie River										
Kakisa	Settlement	Pick-up	Irregular	1	Yes	--	--	--	Yes	Contractor
Lac La Martre	Hamlet ³	Packer	>2	2	No ²	Same	Yes	2	May, July	Hamlet
Nahanni Butte	Settlement	Wagon & Loader	1	1	No	--	--	--	May	Settlement
Port Radium										
Rae	Contractor	Haul-All	>2	2	Yes	Different	Yes	2	Yes	Hamlet
Rae Lakes	Settlement	Dump truck	2	2	Yes	Case Loader	Yes	3	No	Individuals
Snare Lake										
Snowdrift	Settlement	Stake truck	2	2	Yes	Same	Yes	2	June	Settlement
Trout Lake	Settlement	Dump truck	1	2	Yes ⁴	--	--	--	May	Settlement
Wrigley	Settlement	Stake truck	1	2	No	--	--	--	May	Settlement

1. One ton truck with sealed metal dump box

2. Burn at school only

3. Bins are provided to all residences by the Hamlet

4. In winter only

4. SOLID WASTE DISPOSAL

Results of the solid waste disposal component of the survey are summarized in Table 3. 13 of 44 (30%) communities dispose of wastes in trenches while 8 of 44 (18%) communities dispose of wastes on flat land and 12 of 44 (27%) communities dispose of wastes on sloping land. Seven communities deposit wastes in a depression while only 2 communities deposit wastes over an embankment.

Modern landfill sites in the NWT are normally designed for at least a 20 year life. As shown in Table 4, 45% (20 of 44) communities have disposal sites which were constructed within the past five years, while 43% (19 of 44) of the communities are expected to reach the end of their useful lives within the next five years. Note that some communities (Paulatuk, Detah, Kakisa, Rae Lakes, Trout Lake) appear in both columns, indicating that the design life was much less than 20 years in their cases.

TABLE 4 RECENTLY CONSTRUCTED AND AGING DISPOSAL SITES (1989 survey)

Recently Constructed Sites		Aging Sites	
Community	Age (yrs)	Community	Estimated Life Remaining (yrs)
Clyde River	1	Artic Bay	5
Whale Cove	0	Broughton Island	2
Coppermine	0	Cape Dorset	0
Gjoa Haven	3	Pond Inlet	1
Spence Bay	1	Chesterfield Inlet	2
Aklavik	2	Repulse Bay	5
Artic Red River	1	Fort Franklin	5
Fort Franklin	1	Fort McPherson	5
Fort Norman	2	Paulatuk	3
Paulatuk	2	Sachs Harbour	1-2
Tuktoyaktuk	2	Dettah	1
Dettah	3	Rae-Edzo	1/2
Enterprise	2	Fort Resolution	1/2
Fort Liard	2	Kakisa	5
Fort Providence	2	Lac La Martre	5
Fort Resolution	2	Nahanni Butte	0
Kakisa	5	Rae	1-2
Lac La Martre	5	Rae Lakes	3-5
Rae Lake	5	Trout Lake	0
Trout Lakes	4		

Only 11 (25%) of the communities reported fencing around the disposal site, 2 of these have full fencing while the remaining sites are partially fenced. Of the 33 communities without any type of fencing, 23 (70%) thought that fencing would be beneficial. One criticism against fencing was that wind blown garbage would stick to the fence and allow snow to accumulate within the site.

A well planned disposal site segregates domestic solid wastes from bulky wastes and honey bags. In the communities surveyed, 7 of 44 (16%) communities did not have a separate site for bulky waste disposal. 7% (3 of 44) of the communities did not have separate disposal sites for honey bags. When honey bags are dumped amongst the domestic waste it creates a potential public hazard and therefore is unacceptable. Table 5 lists the communities with segregation problems.

TABLE 5 SEGREGATION PROBLEMS OF SOLID WASTE DISPOSAL

No Separate Honey Bag Area	No Separate Bulky Waste Area
Hall Beach Chesterfield Inlet Repulse Bay	Sachs Harbour Fort Liard Fort Providence Kakisa Nahanni Butte Trout Lake Wrigley

The disposal of used oil is not governed by any regional by-law at the present time. Consequently, various communities deal with the problem in different ways. A separate disposal area is maintained for used oil disposal in 58% of the communities while 72% of the communities believe that such a separate area is beneficial. Many communities (64%) spread used oil on the domestic waste to aid burning at the dump site. A small proportion (11%) store the oil in 205 L drums. Only 8% of the communities spread used oil on roads to assist in dust control.

Table 3. Survey Summary of Solid Waste Disposal

Community	Disposal Site Location (km) from center of com.	Disposal Site Description	Disposal Site Size (m)	Age (yrs)	Estimated Life Remaining (yrs)	Fencing	Fencing Beneficial?	Separate Bulky Waste Area (m)	Separate Honey Bag Area (m)	Separate Used Oil Area	Separate Used Oil Area Beneficial	Current Used Oil Disposal Method	Hazardous Waste Disposal Problem
BAFFIN REGION	Arctic Bay	Slope	50x60	10	5	NO	NO	100x80	10x10	NO	NO	Burn	YES
	Broughton Island	Trench	50x50x3	17	2 ¹	NO	YES	YES	YES	YES	YES	Drums	NO
	Cape Dorset	Trench	25x20x30	6	0	NO	YES	300x200	60x60x30	YES	YES	Burn	NO
	Clyde River	Flat	300x300x0.75	1	20	NO	YES	300x300	10x20	YES	YES	Drums	NO
	Grise Fiord	Flat	20x10		16	NO	NO	50x30	NO ²	NO	NO	Dump	NO
	Hall Beach												
	Iqloolik												
	Iqaluit												
	Lake Harbour	Trench	60x30x3	17	10 to 15	Partial		Limited	YES ³	YES ⁴	YES	Drums	YES
	Nanisivik												
KEEWATIN REGION	Pangnirtung												
	Pond Inlet	Slope	200x100	10	1	NO		YES	150x150	YES	YES	Burn	NO
	Resolute Bay	Slope	65x80	15	20	NO		15x20	YES ⁵	YES	YES	Drums	NO
	Sanikiluaq	Slope	300x300	17	10	NO	YES	500x500	100x100x15	YES	YES	Burn	NO
	Arviat	Embankment	1000x1000	15	20	NO	NO	1000x1000	300x300	YES	YES	Burn	NO
	Baker Lake												
	Chesterfield Inlet	Depression	80x40	12	2	NO	YES	60x110	NO	YES	YES	Burn	NO
	Coral Harbour												
	Rankin Inlet	Slope		14	20	NO	YES	YES	YES	YES	YES	Burn	NO
TOO CLOSE TO COMMUNITY	Repulse Bay	Slope	300x200		5	NO	YES	300x200	NO	NO	NO	Burn	NO
	Whale Cove	Slope	105x25x3	0 ⁷	20	NO	YES	80x40	20x20x4	YES	YES	Drums	YES ⁸
	2.5 S												
	1.5 W												
	2.5 SE												
	0.5 NE												
	1.5 NW												

1. TOO CLOSE TO COMMUNITY

2. SEWAGE LAGOON DURING SUMMER

3. 50 M NE OF BURNING SITE

4. 150 M NE OF BURNING SITE

5. MOT CONTROLLED

6. SEWAGE LAGOON

7. NEW SITE

8. POWER TRANSFORMERS

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Table 3. Survey Summary of Solid Waste Disposal (continued)

Community	Disposal Site Location (km) from center of com.	Disposal Site Description	Disposal Site Size (m)	Age (yrs)	Estimated Life Remaining (yrs)	Fencing	Fencing Beneficial?	Separate Bulky Waste Area (m)	Separate Honey Bag Area (m)	Separate Used Oil Area	Separate Used Oil Beneficial	Current Used Oil Disposal Method	Hazardous Waste Disposal Problem
KITIKMEOT REGION													
Bathurst Inlet	1.8 NE	Slope	80x30	15	5 to 10	NO	YES						NO
Cambridge Bay	4.5 W	Slope	80x60	0 ¹	20	NO	YES						NO
Coppermine	1.7 SE	Depression ²	60x60	3	10 to 15	NO	YES						NO
Gloa Haven	1.3 N	Along Hill	100x50	10	15	NO	YES						NO
Holman Island	0.9 S	Depression	60x30	10	10	NO	NO ³						NO
Pelly Bay	2.2 NW	Slope	70x60	1	19	YES	YES						NO
Spence Bay													
INUUVIK REGION													
Aklavik	2.5 NW	Depression	30x20x2	2	15	NO	NO	35x20	15x15	YES	YES	Burn	NO
Arctic Red River	2 NE	Trench	20x3x3	1	20	NO	NO	30x30	3x3x3	YES	YES	Burn ⁴	NO
Colville Lake	1.5 NE	Trench	23x10x2.5	1	5	NO	YES	35x30	5x4x2	NO	NO	Burn	NO
Fort Franklin	1.5 NE	Trench	50x3x2.5	8	8	NO	NO	5 YES ⁵	3x3x3	YES	YES	Burn	NO
Fort Good Hope	8 N	Depression	45x25	7	5	NO	YES	YES ⁶	20x35x2.5	YES	YES	Burn	NO
Fort McPherson	3 SE	Flat	40x20x1.5	2	20	Partial		20x20	10x10x2	YES ⁷	YES	Burn, Road	NO
Fort Norman													
Inuvik													
Norman Wells	0.5 NW	Trench	4x20x3	2	3	NO	YES	50x30	25x15x2	YES	YES	Burn	NO
Paulatuk	1.3 W	Embankment	100x80	10	1 to 2	NO	NO	NO		YES	NO	Burn	NO
Sachs Harbour	5 S	Slope	100x100	2	10	Partial		50x50	4x4x3	YES	YES	Burn ⁸	NO
Tuktoyaktuk													

- NEW SITE
- MAN-MADE BERMED AREA
- NATURALLY PROTECTED FROM WIND
- BY POWER CORPORATION
- ALL AROUND COMMUNITY
- SCRAP METAL 25MX20M VEHICLES 50MX20M
- DEAD ANIMAL PIT 4X6M AT BULKY WASTE SITE
- INDUSTRY BURNS OWN WASTE OIL

Table 3. Survey Summary of Solid Waste Disposal (continued)

Community	Disposal Site Location (km) from center of com.	Disposal Site Description	Disposal Site Size (m)	Age (yrs)	Estimated Life Remaining (yrs)	Fencing	Fencing Beneficial?	Separate Bulky Waste Area (m)	Separate Honey Bag Area (m)	Separate Used Oil Area	Separate Used Oil Area Beneficial	Current Used Oil Disposal Method	Hazardous Waste Disposal Problem
FORT SMITH REGION													
Detah	3NW	Trench	7x2x2	3	1	NO	YES	500x500	YES	NO	YES	Dump	NO
Rae-Edzo	3NE	Flat	100x200	20	0.5	Partial	YES	YES	15x12x3	YES	YES	Road, Dump	NO
Enterprise	7N	Trench	47x18x1.5	2	10	Partial	YES	20x20	-	NO	YES	D.O.T. ²	NO
Fort Liard	15 SW	Flat	175x130x2	2	15	Partial	NO	NO	-	YES	YES	Burn	NO
Fort Providence	2NE	Depression ⁴	100x300x2	2	15	NO	NO	NO	-	NO	NO	Dump	NO
Fort Resolution	2N	Trench	30x15x1.5	2	0.5	NO	YES	30x15	-	NO	NO	Road	NO
Fort Simpson													
Fort Smith													
Hay River													
Jean Marie River													
Kakisa	0.5 E	Trench	50x50x2	5	5	Full		NO	-	NO	NO		NO
Lac La Martre	5NE	Flat	50x50	5	5	Full		75x75	100x100	NO	NO	Burn	NO
Nahanni Butte	1	Flat		20	0.5	NO	YES	NO	-	NO	NO	Dump	NO
Port Radium													
Rae	3 E	Trench	65x65	20	1 to 2	Partial	YES	YES	20x30x6	NO	YES	Burn	NO
Rae Lakes	1.2 SE	Depression	40x40x3	5	3 to 5	NO		50x30	20x20x3	NO	YES		
Snare Lake													
Snowdrift													
Trout Lake	1 SE	Trench	100x100x1	4	0	Partial	Yes	YES	YES	NO	YES	Burn	Not Sure
Wrigley	5NE	Flat		10	5 to 10	NO	NO	NO	-	NO	YES	Burn, Dump	NO
Yellowknife													

1. AREA NOT LIMITED TO SIZE
2. NEAR SEWAGE LAGOON
3. DEPARTMENT OF TRANSPORT RESPONSIBLE
4. OLD GRAVEL PIT
5. NEW SITE CONSTRUCTED IN 1990

5. OPERATION AND MAINTENANCE

Effective operation and maintenance of solid waste disposal sites can reduce the potential risks to public health or to the environment and improve the aesthetics of the community. One aspect of operation and maintenance which deserves attention is whether access to the disposal site should be controlled. Controlled access is normally achieved by an enclosing fence with a locking gate and/or a gate man. Only 3 of 44 (7%) communities reported some form of controlled access. Although some comments received supported restricted access, there were some which did not support this because it was thought that a closed site would create more problems as residents would merely dump their garbage at the gate outside normal hours.

Burning of wastes at the disposal site to reduce volume and reduce scavenging by people and animals is practised by 36 of 44 (82%) communities. 20% (9 of 44) burn daily while 32% (14 of 44) burn wastes on a weekly basis. In most cases, burning is only permitted when favourable winds prevail so that blowing smoke and ash do not pose serious health or environmental hazards.

The minimum acceptable solid waste disposal system is the modified landfill method. Proper operation and maintenance of the modified landfill requires significant cover material and frequent covering and compaction. From Table 6 it can be shown that 13 of 44 (30%) communities indicated inadequate availability of cover material while 4 of 44 (9%) communities indicated that they never covered their wastes. In addition, 3 of these 4 sites did not practice compaction of wastes. It must be concluded that those sites are operated as open dumps and are therefore unacceptable, (Table 7). Acceptably operated and maintained sites in 12 communities are also shown in Table 7. These sites are covered at least 2 or 3 times per year, usually during the summer when cover materials are workable, and they are considered to operate as modified landfill sites. Seventeen disposal sites are covered once per year or irregularly and may be considered open dump/landfills. Although they do not meet standards of a modified landfill, they may be temporarily acceptable. There was insufficient information on 10 communities to judge the disposal acceptability.

6. DISCUSSION AND CONCLUSIONS

Three distinct methods of solid waste disposal exist in the surveyed communities; the modified landfill method, open dump/landfill method and the open dump method. The modified landfill method requires an engineered site characterized by well segregated disposal areas and frequent occasions of cover and compaction. The open dump/landfill places little emphasis on waste segregation and its wastes are covered and compacted irregularly. Open dumps do not segregate wastes nor are their wastes covered and compacted. With this simplified set of criteria, the open dump/landfill is the predominate method of solid waste disposal in the surveyed communities (41%), followed by the modified landfill method (27%) and the open dump method (9%). Follow-up has to occur in 10 communities (23%) where insufficient information has been provided. (See Table 7).

Table 6. Survey Summary of Solid Waste Operation and Maintenance

Community	Controlled Access To Site	Disposal Site Burning Frequency	Cover Material Readily Available	Cover Frequency	Compaction Frequency	Earth Moving Equipment Available
BAFFIN REGION						
Arctic Bay	NO	Daily	YES	Yearly	Monthly	Dozer, Loader, Dump Truck
Broughton Island	NO	Daily	NO	Yearly	Yearly	Dozer, Loader, 2 Dump Trucks
Cape Dorset	NO	Daily	NO	As Required	NO	Dozer, 2 Loaders, Dump Truck
Clyde River	NO	Daily	Gravel	Never	NO	Dozer, Loader, Dump Truck
Grise Fiord	NO	Daily	Gravel, Rock	Yearly	Monthly	2 Dozers, Loader, Dump Truck
Hall Beach	NO	Daily				
Igloodik						
Iqaluit		YES ¹				
Lake Harbour						
Nanisivik						
Pangnirtung	YES	Daily	Gravel	Yearly	Yearly	2 Tractors
Pond Inlet	YES	Daily	NO	Monthly	Monthly	Loader
Resolute Bay	NO	Yes ²	NO	Never	Yes	Dozer, Loader
Sanikiluaq						
KEEWATIN REGION						
Arviat	NO	Weekly	YES	Yearly	Weekly	Dozer, 2 Loaders
Baker Lake						
Chesterfield Inlet	NO	Twice Per Week	NO	As Required	NO	Grader, Loader, Dump Truck, Tractor
Coral Harbour						
Rankin Inlet	NO	Daily	NO	Yearly	NO	Dozer, Loader, Dump Truck
Repulse Bay	NO	Weekly ³	NO		Monthly	Dozer, Loader
Whale Cove						Dozer, Loader

1. ONLY WHEN SUITABLE WINDS PERMIT

2. WHEN REQUIRED

3. SUMMER ONLY

Table 6. Survey Summary of Solid Waste Operation and Maintenance (continued)

Community	Controlled Access To Site	Disposal Site Burning Frequency	Cover Material Readily Available	Cover Frequency	Compaction Frequency	Earth Moving Available
KITIKMEOT REGION						
Bathurst Inlet	NO	Weekly	YES ¹			
Cambridge Bay	NO	Weekly	Sand Pit			
Coppermine	NO	Weekly	YES			
Gjoa Haven	NO	Weekly	YES ¹			
Holman Island	NO	Weekly	YES			
Pelly Bay	NO	Weekly	YES			
Spence Bay	NO	Weekly	YES			
INUVIK REGION						
Aklavik	NO	Weekly	NO			
Arctic Red River	NO	Yes ²	Shale Pit	2-3 Times per Year Monthly	Monthly Monthly	CAT CAT, Loader, Dump Truck
Colville Lake	NO	Weekly	Gravel, Clay	Yearly	Yearly	CAT Loader
Fort Franklin	NO	Occasionally	Fill, Gravel	Occasionally ³	NO	Loader
Fort Good Hope	NO	Weekly	Clay, Shale	2-3 Times a year	2-3 Times a Year	Loader, CAT
Fort McPherson	NO	Monthly	Trench Material	2-3 Times a Year	Monthly	Loader, CAT
Fort Norman	NO					
Inuvik						
Norman Wells	NO	Occasionally	Gravel	Yearly	Yearly	Dozer, Loader
Paulatuk	NO	Weekly	Gravel	2 Times a Year	2 Times a Year	Loader, CAT
Sachs Harbour	Partially ⁴	Daily ⁵	NO	Weekly ⁵	Yearly	Dozer, Loader, Dump Truck
Tuktoyaktuk						

1. GRANULAR SOURCE FROZEN 9+ MONTHS OF THE YEAR

2. OCCASIONALLY IN WINTER

3. AFTER BURNING

4. GATE IS NOT LOCKED

5. DURING THE SUMMER

Table 6. Survey Summary of Solid Waste Operation and Maintenance (continued)

Community	Controlled Access To Site	Disposal Site Burning Frequency	Cover Material Readily Available	Cover Frequency	Compaction Frequency	Earth Moving Available
FORT SMITH REGION						
Detah	NO	3 Times a Week	YES	Occasionally	NO	None
Rae-Edzo	NO	Occasionally ¹	NO	Monthly ²	NO	Loader, Skidder, Tractor
Enterprise	NO	NO	YES	Monthly, Biweekly ³	Biweekly	
Fort Liard	NO	Occasionally	Excavated Material	Monthly	Monthly	Tractor
Fort Providence	NO	Weekly	Gravel	Never	NO	Tractor
Fort Resolution	NO	Weekly	NO	As Required	As Required	CAT, Loader, Grader
Fort Simpson						
Fort Smith	NO	NO	YES			Many Available
Hay River						
Jean Marie River						
Katusa	NO	NO	Excavated Material	Yearly	NO	Tractor
Lac La Martre	NO ⁴	As Required	Sandy Soil	As Required	NO	CAT
Nahanni Butte	NO	YES	NO	Never	NO	Tractor
Port Radium						
Rae	NO	NO	NO ⁵	As Required	NO	Skidder, Loader, Grader
Rae Lakes				Weekly	Weekly	Skidder, Loader
Snare Lake						
Snowdrift	NO	4 Times a Year		3-4 Times a Year	NO	CAT, Loader
Trout Lake	NO	NO	NO	Irregular	NO	CAT, Loader
Wrigley	NO	NO	Excavated Material	Irregular	NO	Tractor
Yellowknife						

1. WHEN SOMEONE IGNITES WASTE
2. DIFFICULT WITHOUT ADEQUATE COVER MATERIAL
3. MONTHLY IN WINTER WITH SNOW
BIMONTHLY IN SUMMER
4. GATE IS LEFT OPEN
5. CLOSEST FILL IS 8KM AWAY

TABLE 7 METHOD OF SOLID WASTE DISPOSAL BY COMMUNITY

Modified Landfill (Acceptable)	Open Dump/Landfill (Temporarily Acceptable)	Open Dump (Unacceptable)	Insufficient Information
Resolute Bay Aklavik Arctic Red River Fort McPherson Fort Norman Sachs Harbour Tuktoyaktuk Rae Edzo Enterprise Fort Liard Rae Lakes Snowdrift	Arctic Bay Broughton Island Clyde River Lake Harbour Pond Inlet Arviat Chesterfield Inlet Rankin Inlet Fort Franklin Paulatuk Detah Fort Resolution Kakisa Lac La Martre Rae-Edzo Trout Lake Wrigley	Hall Beach Sanikiluaq Fort Providence Nahanni Butte	Cape Dorset Cambridge Bay Coppermine Gjoa Haven Holman Island Pelly Bay Spence Bay Hay River Repulse Bay Whale Cove

In order to assess the change of solid waste management in the surveyed communities, these results can be compared with similar results determined by Christensen in his 1982 study [3]. As part of the Christensen study, the solid waste disposal system of each community was judged with respect to a set of criteria to determine public health or environmental deficiencies. For example, the lack of honey bag segregation or a generally uncontrolled solid waste disposal site would typically be related to public health deficiencies whereas, poor management capability or an unorganized self-haul community would be related to environmental deficiencies.

Table 8 contains the surveyed communities which have shown evidence of public health or environmental deficiencies.

TABLE 8 COMMUNITIES WITH PUBLIC HEALTH OR ENVIRONMENTAL DEFICIENCIES

Public Health Deficiency	Environmental Deficiency
Fort Norman Sanikiluaq Rankin Inlet Repulse Bay Hall Beach Chesterfield Rae-Edzo	Hall Beach Sanikiluaq Fort Providence Nahanni Butte

A comparison with the results from the Christensen study is given in Table 9.

TABLE 9 *COMPARISON OF STATUS OF SOLID WASTE DISPOSAL SYSTEMS*

	Christensen, 1982	Heinke & Wong, 1990
Public Health Deficiency	58% (36/62)	16% (7/44)
Environmental Deficiency	32% (20/62)	9% (4/44)

Clearly a significant reduction in both public health deficiency and environmental deficiency has occurred.

So far, all observations indicate significant improvement of the status of solid waste disposal however, any definite conclusions should be withheld until the surveys from the remaining communities are received.

REFERENCES

- [1] Heinke, G.W., North of 60° - Report on Municipal Services in Communities of the Northwest Territories, for the Department of Indian and Northern Affairs, 1973.
- [2] Cameron, J.J., John Dusseault and Brett Elkin Community Water and Sanitation Services, 1982, 1983 for Baffin, Fort Smith, Keewatin, Kitikmeot and Inuvik Regions.
- [3] Christensen, V., Status of Water and Sanitation Facilities in the Northwest Territories, in Utilities Delivery in Cold Regions (editor D.W. Smith), 1982.
- [4] Heinke, G.W., Wong, J., Guidelines for the Planning, Design, Operation, and Maintenance of Solid Waste Modified Landfill Sites in the Northwest Territories, for the Department of Municipal and Community Affairs, 1990.

NORTHWEST TERRITORIES SOLID WASTE DISPOSAL SURVEY

APPENDIX A

SAMPLE COMPLETED SURVEY

Location 100-5000

Questionnaire
Completed by

D.C. Gray-Kennel
NAME

100-5000
ADDRESS

100-5000
POSITION

100-5000
TEL. NO.

INSTRUCTIONS

1. The Questionnaire should be completed by persons in the Department who participate with solid waste disposal.
2. Complete and return the Questionnaire to the nearest mailing office or mail to Mr. Don Colburn, P.O. Box 1000, Yellowknife.
3. Complete and return the Questionnaire to the nearest mailing office or mail to the Department.
4. The return of the Questionnaire will be acknowledged with a report, prepared by a Consultant (Dr. G.P. Murray) and, Chairman of the Board of the NWCT, a report of the results of the survey will be made to the Department.

Thank you for your cooperation.

NORTHWEST TERRITORIES

SOLID WASTE DISPOSAL

SURVEY

Community: RAE - EDZO

Questionnaire
Completed by:

D E. (DAN) KONECKY
NAME

RAE - EDZO
ADDRESS

SENIOR ADMIN OFFICER
POSITION

392-6500
TEL. NO.

INSTRUCTIONS

1. The Questionnaire should be completed by someone in the Department most knowledgeable with solid waste disposal.
2. Complete and return the Questionnaire in the enclosed envelope within one month to Mr. Ken Johnson, P.Eng., MaCa, Yellowknife.
3. Complete one Questionnaire for each solid waste disposal site in the community.
4. The results of the Questionnaire will be incorporated into a report, prepared by a Consultant (Dr. G.W. Heinke, P.Eng., University of Toronto) for MaCa. A copy of the report will be sent to each community when completed.

Thank you for your cooperation.

PART A: SOLID WASTE COLLECTION

A.1 SOLID WASTE IS COLLECTED BY:

- ☐ Settlement, Hamlet or Town
☒ Contractor
☐ Other. Specify: _____

A.2 WHAT TYPE OF COLLECTION VEHICLE IS USED TO COLLECT SOLID WASTE?

- ☐ Packer Truck
☐ Stake or Pick-up Truck Model: _____
☒ Haul-All Capacity: _____
☐ Other. Specify: _____

A.3 HOW OFTEN IS SOLID WASTE COLLECTED FROM EACH HOME?

- ☐ Once per week
☒ Twice per week
☐ More than twice per week
☐ Other. Explain: _____

A.4 HOW MANY MEN MAKE UP THE COLLECTION CREW?

- ☐ 1 man
☒ 2 men
☐ 3 men
☐ More than 3 men

A.5 IS BURNING OF WASTES IN OIL DRUMS PRACTICED AT THE HOME?

- ☐ Yes
☒ No

A.6 HONEY BAG WASTES ARE CONSIDERED TO BE SOLID WASTES. IF HONEY BAGS ARE USED IN YOUR COMMUNITY, HOW ARE THEY COLLECTED?

- ☐ With the domestic solid waste
☐ Separately, using the same collection vehicle
☒ Separately, using a different collection vehicle
☐ Other. Specify: _____
- Vehicle type: ONE TON TRUCK
WITH METAL (SEALED)
DAMP BOX.

A.7 THE FREQUENCY OF HONEY BAG COLLECTION IS:

- ☐ Once per week
☐ Twice per week
☒ More than twice per week. Explain: SIX _____

PART A: SOLID WASTE COLLECTION

Page 2

(Continued)

A.8 DOES YOUR COMMUNITY PARTICIPATE IN AN ANNUAL SPRING CLEAN-UP?

☒ Yes. Specify date of last spring clean up: ONCE SNOW IS GONE
☐ No

A.9 LARGE, BULKY WASTES SUCH AS USED VEHICLES, AND APPLIANCES ARE COLLECTED BY:

☐ Solid waste collection crew
☐ Contractor
☐ Individuals
☒ Other. Specify: HAMLET CREW AS REQUIRED

A.10 PLEASE MAKE ANY COMMENTS YOU WISH REGARDING SOLID WASTE COLLECTION IN YOUR COMMUNITY.

PART B: SOLID WASTE DISPOSAL

- B.1 DESCRIBE THE LOCATION OF THE SOLID WASTE DISPOSAL SITE IN RELATION TO THE COMMUNITY (attach map if available).

Distance from Centre of Community: 3 (km)

Direction: NORTH EAST (e.g. northeast)

- B.2 SOLID WASTE IS DEPOSITED AT THE SOLID WASTE DISPOSAL SITE,

☒ On flat land	☐ In a depression
☐ On sloping land	☐ In a trench
☐ Over an embankment	☐ Other. Specify: _____

- B.3 PLEASE PROVIDE YOUR BEST ESTIMATE OF THE SIZE OF THE SITE AVAILABLE FOR SOLID WASTE DISPOSAL.

Length: 100 (m)

Depth (for trenches only): ? (m)

Width: 200 (m)

Look outcropping, depth varies.

- B.4 HOW LONG HAS THE PRESENT SITE BEEN IN OPERATION?

20 years

- B.5 IN YOUR OPINION, HOW MUCH LONGER WILL THE PRESENT SITE ADEQUATELY SERVICE THE NEEDS OF THE COMMUNITY?

1/2 years

- B.6 IS THE DISPOSAL SITE FENCED?

☐ No

☒ Yes. If yes,

☐ full fencing around the perimeter
☒ partial fencing

- B.7 IF YOU ANSWERED 'NO' TO THE QUESTION B.6, DO YOU THINK FENCING WOULD BENEFIT THE DISPOSAL SITE AND OPERATION?

☐ No

☒ Yes

PART B: SOLID WASTE DISPOSAL

Page 2

(Continued)

- B.8 ARE BULKY WASTES/METAL WASTES DISPOSED OF SEPARATELY FROM SOLID WASTES?

☐ No
☒ Yes

- B.9 PLEASE PROVIDE YOUR BEST ESTIMATE OF THE SIZE OF THE SITE AVAILABLE FOR BULKY WASTES/METAL WASTES DISPOSAL.

Length: _____ (m)

Width: _____ (m)

no specific size - area not fenced not limited to size.

- B.10 IF HONEY BAGS ARE USED, ARE THEY DISPOSED OF SEPARATELY FROM SOLID WASTES?

☐ No
☒ Yes. Specify Location: NEAR SEWAGE LAGOON

- B.11 PLEASE PROVIDE YOUR BEST ESTIMATE OF THE SIZE OF THE SITE AVAILABLE FOR HONEY BAG DISPOSAL.

Length: 15 (m)

Width: 12 (m)

Depth (where applicable): 3 (m)

- B.12 ARE USED OIL WASTES DISPOSED OF SEPARATELY FROM DOMESTIC WASTES?

☐ No
☒ Yes. Specify Location: _____

- B.13 IN YOUR OPINION, SHOULD USED OIL BE DISPOSED OF SEPARATELY?

☐ No
☒ Yes

- B.14 HOW DO YOU CURRENTLY DISPOSE OF USED OIL?

if not used for surface dust control, dumped at old sanitary land fill site.

(Continued)

B.15 IS THE DISPOSAL OF HAZARDOUS OR TOXIC WASTES (for example, PCB's) A PROBLEM IN YOUR COMMUNITY?

X
—

No

Yes. If yes, what do you currently do for hazardous waste disposal?

B.16 PLEASE MAKE ANY COMMENTS YOU WISH TO MAKE REGARDING SOLID WASTE DISPOSAL IN YOUR COMMUNITY?

Solid waste sites should be located in area not visible to the public - preference would be an area that is surrounded by trees and away from the community by more than five kilometers. Site should be on ground where trenches could be dug and covered on a weekly basis. The site we have currently needs improvement - relocation is in order as it is not a proper site. A site operated like ours should be closed down for all reasons. Health, Aesthetics and environment.

PART C: OPERATION AND MAINTENANCE

C.1 IS ACCESS TO THE DISPOSAL SITE CONTROLLED?

☒ No
☐ Yes

Please comment:

It is best if site is not closed - if closed garbage is dumped at the gate, causes more work. Proper operation of a site should require a gate man and the person to be responsible for making sure material is dumped into the trench. This

C.2 IS BURNING OF WASTES AT THE DISPOSAL SITE PRACTICED?

☐ No
☒ Yes. If yes,

☐ Everyday
☐ Once a week
☐ Once a month
☒ Other. Specify: when ever some one lights it

C.3 IS ADEQUATE COVER MATERIAL READILY AVAILABLE?

☒ No
☐ Yes

Please comment (source, type):

Site should be covered on a regular basis - weekly at least - under normal circumstances, daily.

PART C: SOLID WASTE DISPOSAL

Page 2

(Continued)

C.4 HOW OFTEN ARE THE WASTES COVERED WITH GRANULAR MATERIAL:

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Never

☒ Other. Specify: Day for at least monthly - but this is
difficultly not adequate

C.5 ARE THE WASTES COMPACTED ON A REGULAR BASIS?

- ☒ No
- ☐ Yes. If yes,

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Yearly
- ☐ Other. Specify: _____

C.6 PLEASE LIST THE TYPES OF EARTH-MOVING EQUIPMENT AVAILABLE FOR USE AT THE DISPOSAL SITE.

Loader and skidder, tractors.

C.7 PLEASE MAKE ANY COMMENTS YOU WISH ON MAINTENANCE AND OPERATIONS OF WASTE DISPOSAL IN YOUR COMMUNITY.

The sanitary land fill site should be relocated to an
area which has adequate material for cover, a good
location would be an old gravel pit. The site
should have adequate depth so that trenches can
be dug and covered on a weekly basis, if not
daily!

DISTRIBUTION OF CANADA SCHOLARSHIPS

CANADA SCHOLARSHIPS AWARDED - 1989

	ARTS AND SCIENCE	SCARBOROUGH	APPLIED SCIENCE	FORESTRY	TOTAL
MALE	103	9	17	0	129
FEMALE	77	4	46	0	127
TOTAL	180	13	63	0	256

RESULT OF ALLOCATION FORMULA, WITH 50 % FEMALE QUOTA

	ARTS AND SCIENCE	SCARBOROUGH	APPLIED SCIENCE *	FORESTRY *	TOTAL
MALE	60	12	56	2	130
FEMALE	59	11	55	1	126
TOTAL	119	23	111	3	256

In 1989, neither Applied Science nor Forestry had sufficient eligible female applicants for these numbers of awards.

APPENDIX A: THE COLLECTIVE COLLECTION

The Project

Master's Thesis, Cape Town

Level where should be added or daily. This helps to maintain the collection of the community.

In my community we do not have any other collection point. Therefore, they have to go to the nearest collection point for their collection.

There is only one collection point in the community.

The collection is done by the community members.

APPENDIX B

Our community is small with only 12 members of staff. Therefore,

the staff members are not enough to handle the collection. It is not a good idea.

SUMMARY OF COMMENTS

I suggest spending a little money for a small collection point in the way of providing an AM/FM radio and some other items in the vehicle. Creating a community with resources for the collection of the waste in the community. It is not a good idea to make it a good idea.

David Arnold

Master's Thesis, Cape Town

During the collection of the waste, I suggest that the collection should be done by the community members and the staff members. Additional staff are hired by the community to handle the waste collection.

David Arnold

Master's Thesis, Cape Town

The community requires 2 collection points. The project we are planning is the project of the collection. The project is the collection of the waste in the community.

David Arnold

Master's Thesis, Cape Town

During the collection of the waste, the staff members are hired by the community.

David Arnold

Master's Thesis, Cape Town

The project we are planning is the project of the collection of the waste in the community.

COMMENTS - SOLID WASTE COLLECTION

Ray Faubert
Hamlet Foreman, Cape Dorset

- . Solid waste should be picked up daily. This helps to maintain the aesthetics of the community.
- . In my community, we do not have expensive vehicles such as "Packers", etc. A simple dump body truck is more efficient for the following reasons:
 - i) There is only one mechanic hydraulic control to maintain.
 - ii) The garbage is loose and can easily be disposed of by burning.
 - iii) Our community is small with only 17 kilometres of road, therefore the small motor vehicle (6 cylinder) diesel is the better vehicle to buy and it is more economical to operate and maintain.
- . I suggest spending a little money for operator comfort in the way of providing an AM/FM radio and comfortable seats in the vehicle. Creating a harmonious work situation for the operator (who sits in this vehicle for 8 hours a day) results in better work performance.

David Arreak
Hamlet Foreman, Clyde River

- . During annual spring clean-up, involves 3 vehicles such as regular garbage truck, dump truck and 2 front end loaders, additional crew are hired by Hamlet to haul the waste from town to garbage dump.

Marla Limoosin
Hamlet Manager, Rankin Inlet

- . The community requires 2 garbage trucks. The service we are providing at the present time is inadequate. The formula in the standards and criteria confirms the need for 2 trucks.

Cecil Lafferty
Community Manager, Fort Resolution

- . Funding should be made available for large bulky waste.

Les Kunihillsi
Foreman, Broughton Island

- . Incoming new site, need 12 feet high fenced northside and southside.

Ray Faubert
Hamlet Foreman, Cape Dorset

- . The area should be fenced in to prevent the wind from blowing refuse back into the community and also to prevent people from dragging garbage home and creating backyard eyesores.
- . A burner stack could be built with an open garbage shoot. The truck will back up to the shoot entrance and dump it's load on the platform. As the refuse slides down the platform, it will end up on 6" grates. Under these grates you would install 2 blast furnaces. The garbage will then be burnt on the grate and above the grate.

Then the unburnable substances will fall through the 6" bars to the platform below. This refuse will be the unburnable leftovers such as cans, tin, etc. This leftover refuse will be considerably smaller in size than when it was first dumped in.

At this point you have several options:

- 1) You can compact it and send it out on a scrap ship.
- 2) Use a loader to take it away and bury it.
- 3) Use it for road fill, side bank fill, etc.

I can provide a blueprint drawing of my idea of this operation.

Moosa Akavate
Hamlet Foreman, Lake Harbour

- . Rumour was heard from MLA meeting last year that old freezers at dump areas may have PCB.
- . Burning bin/cage would help for every day burning no matter where wind coming from.

Ray Mullins
Hamlet Manager, Chesterfield Inlet

- . Would like it (disposal site) fenced to keep foxes from getting at the raw sewage which may be one of the causes for the rabies problem in town this winter.

Bernie Uluadluate, Paul Sabourin
Hamlet Foreman, Hamlet Manager, Whale Cove

- . I would like hazardous or toxic wastes, transformers containing PCB's, disposed separately from our disposal site, where there is no leached runoff to the ocean.

Terry Broekes
Municipal Engineer, Kitikmeot Region

- . I would like to have the used oil burnt separately for more complete combustion. The bottom of an old tank would be used as the burning vessel.

Dan Konelsky
Senior Administrative Officer, Rae-Edzo

- . Solid waste sites should be located in area not visible to the public -preference would be an area that is surrounded by trees and away from the community by more than 5 kilometres. Site should be on ground where trenches could be dug and covered on a weekly basis. The site we have certainly needs improvement - relocation is in order as it is not a proper site. A site operated like ours should be closed down for all reasons, health, aesthetics and environment.

Leon Lafferty
Maintenance Foreman, Rae

- . Dump site should be located away from highway about 4 - 5 km away from community. It should be fenced in with wire mesh and away from visibility, if off highway, the site should be solid fenced. Dumpsite should be close to a gravel supply.

Ray Faubert
Hamlet Foreman, Cape Dorset

- I strongly recommend that each municipality create a by-law which would make it mandatory to have the garbage area fenced off with entry restricted to Hamlet personnel only. The reasons listed below will help to substantiate my recommendations.

A controlled disposal site would prevent:

- a) people from sorting through garbage and bringing it home to their backyards where it would become neighbourhood eyesore.
- b) It would confine garbage inside the compound and prevent it from being blown back into the community, where it could contaminate the environment.
- c) It would eliminate the possibility of stray dogs, etc. dragging contaminated carcasses etc. into town.
- d) Restricted entry would ensure that garbage is dumped in the designated area only and not dropped somewhere along the road or off to the side of the dump as some times happens when people are allowed to cart their own garbage to the site.
- e) It means more control over a vitally important area and control means more efficient, safe management of our environment.

K. King
Hamlet Manager, Arviat

- . Fence garbage dump will not work in Arviat. Paper, plastic will stick to fence, the garbage dump will fill with snow and paper items will blow all over the community.

Marla Limoosin
Hamlet Manager, Rankin Inlet

- Signs that are placed at dump site stating no dumping in specific locations are ignored or knocked down. No control of dumping outside of hamlet operation.

Dan Konelsky
Senior Administrative Officer, Rae-Edzo

- It is best if site is not closed - if closed garbage is dumped at the gate, causes more work. Proper operation of site should require a gate man and this person to be responsible for making sure material is dumped into the trench.
- Site should be covered on a regular basis - weekly at least - under normal circumstances, daily.
- The sanitary landfill site should be relocated to an area which has adequate material for cover, a good location would be an old gravel pit. The site should have adequate depth so that trenches could be dug and covered on a weekly basis, if not daily.

